Silt Fence

Standard Symbol

BMP Objectives
○ Soil Stabilization
● Sediment Control
○ Tracking Control
○ Wind Erosion Control
○ Non-Storm Water Management
○ Materials and Waste Management

Definition and Purpose A silt fence is a temporary linear sediment barrier of permeable fabric designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences allow sediment to settle from runoff before water leaves the construction site.

Appropriate Applications Silt fences are placed:

■ Below the toe of exposed and erodible slopes.

■ Down-slope of exposed soil areas.

■ Around temporary stockpiles.

■ Along streams and channels.

■ Along the perimeter of a project.

Limitations ■ Not effective unless trenched and keyed in.

■ Not intended for use as mid-slope protection on slopes greater than 1:4 (V:H).

■ Must be maintained.

■ Must be removed and disposed of.

■ Don't use below slopes subject to creep, slumping, or landslides.

■ Don't use in streams, channels, drain inlets, or anywhere flow is concentrated.

■ Don't use silt fences to divert flow.

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Standards and Specifications

Design and Layout

■ The maximum length of slope draining to any point along the silt fence shall be 61 m (200 ft) or less.

■ Slope of area draining to silt fence shall be less than 1:1 (V:H).

■ Limit to locations suitable for temporary ponding or deposition of sediment.

■ Fabric life span generally limited to between five and eight months. Longer periods may require fabric replacement.

■ Silt fences shall not be used in concentrated flow areas.

■ Lay out in accordance with Pages 5 and 6 of this BMP.

■ For slopes steeper than 1:2 (V:H) and that contain a high number of rocks or large dirt clods that tend to dislodge, it may be necessary to install additional protection immediately adjacent to the bottom of the slope, prior to installing silt fence. Additional protection may be a chain link fence or a cable fence.

■ For slopes adjacent to water bodies or Environmentally Sensitive Areas (ESAs), additional temporary soil stabilization BMPs shall be used.

Materials

■ Silt fence fabric shall be woven polypropylene with a minimum width of 900 mm (36 inches) and a minimum tensile strength of 0.45-kN. The fabric shall conform to the requirements in ASTM designation D4632 and shall have an integral reinforcement layer. The reinforcement layer shall be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric shall be between 0.1 sec^{-1} and 0.15 sec^{-1} in conformance with the requirements in ASTM designation D4491. Contractor must submit certificate of compliance in accordance with Standard Specifications Section 6-1.07.

■ Wood stakes shall be commercial quality lumber of the size and shape shown on the plans. Each stake shall be free from decay, splits or cracks longer than the thickness of the stake or other defects that would weaken the stakes and cause the stakes to be structurally unsuitable.

■ Bar reinforcement may be used, and its size shall be equal to a number four (4) or greater. End protection shall be provided for any exposed bar reinforcement.

■ Staples used to fasten the fence fabric to the stakes shall be not less than 45 mm (1.75 inches) long and shall be fabricated from 1.57 mm (0.06 inch) or heavier wire. The wire used to fasten the tops of the stakes together when

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joining two sections of fence shall be 3.05 mm (0.12 inch) or heavier wire. Galvanizing of the fastening wire is not required.

Installation

■   Generally, silt fences shall be used in conjunction with soil stabilization source controls up slope to provide effective erosion and sediment control.

■   Bottom of the silt fence shall be keyed-in a minimum of 150 mm (12 inches).

■   Trenches shall not be excavated wider and deeper than necessary for proper installation of the temporary linear sediment barriers.

■   Excavation of the trenches shall be performed immediately before installation of the temporary linear sediment barriers.

■   Construct silt fences with a set-back of at least 1m (3 ft) from the toe of a slope. Where a silt fence is determined to be not practical due to specific site conditions, the silt fence may be constructed at the toe of the slope, but shall be constructed as far from the toe of the slope as practical.

■   Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the barrier; in no case shall the reach exceed 150 meters (490 ft).

■   Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.

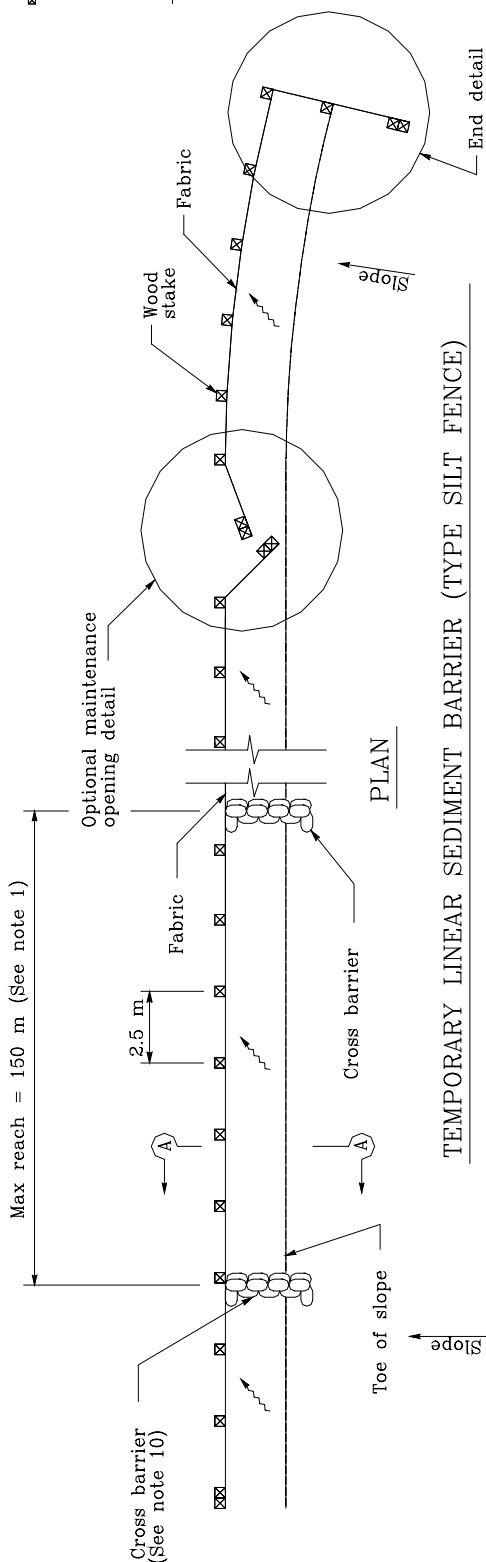■   Install in accordance with Pages 5 and 6 of this BMP.

Maintenance and Inspection

■   Repair undercut silt fences.

■   Repair or replace split, torn, slumping, or weathered fabric.

■   Inspect silt fence when rain is forecast. Perform necessary maintenance, or maintenance required by the Resident Engineer (RE).

■   Inspect silt fence following rainfall events. Perform maintenance as necessary, or as required by the RE.

■   Maintain silt fences to provide an adequate sediment holding capacity. Sediment shall be removed when the sediment accumulation reaches one-third (1/3) of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the RE or disposed of outside the right-of-way in conformance with the Standard Specifications.

■   Silt fences that are damaged and become unsuitable for the intended purpose, as determined by the RE, shall be removed from the site of work, disposed of outside the highway right-of-way in conformance with the Standard Specifications, and replaced with new silt fence barriers.

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■ Holes, depressions or other ground disturbance caused by the removal of the temporary silt fences shall be backfilled and repaired in conformance with the Standard Specifications.

■ Remove silt fence when no longer needed or as required by the RE. Fill and compact post holes and anchorage trench, remove sediment accumulation, and grade fence alignment to blend with adjacent ground.

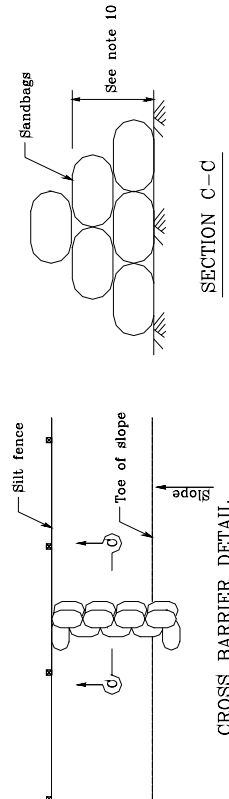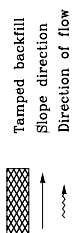Caltrans Storm Water Quality Handbooks
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TEMPORARY LINEAR SEDIMENT BARRIER (TYPE SILT FENCE)

PLAN

- End detail
- Fabric
- Wood stake
- Slope
- Optional maintenance opening detail
- Fabric
- 2.5 m
- Cross barrier
- Max reach = 150 m (See note 1)
- Toe of slope
- Slope
- Cross barrier (See note 10)
- A A

SECTION C-C

- Sandbags
- See note 10

CROSS BARRIER DETAIL

- Silt fence
- Toe of slope
- Slope
- d d

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

TEMPORARY LINEAR SEDIMENT BARRIER (TYPE SILT FENCE)

NO SCALE

ALL DIMENSIONS ARE IN
MILLIMETERS UNLESS OTHERWISE SHOWN

NOTES

1. Construct the length of each reach so that the change in base elevation along the reach does not exceed 1/3 the height of the linear barrier, in no case shall the reach length exceed 150m.

2. The last 2.5 m of fence shall be turned up slope.

3. Stake dimensions are nominal.

4. Dimension may vary to fit field condition.

5. Stakes shall be spaced at 2.5 m maximum and shall be positioned on downstream side of fence.

6. Stakes to overlap and fence fabric to fold around each stake one full turn. Secure fabric to stake with 4 staples.

7. Stakes shall be driven tightly together to prevent potential flow-through of sediment at joint. The tops of the stakes shall be secured with wire.

8. For end stake, fence fabric shall be folded around two stakes one full turn and secured with 4 staples.

9. Minimum 4 staples per stake. Dimensions shown are typical.

10. Cross barriers shall be a minimum of 1/3 and a maximum of 1/2 the height of the linear barrier.

11. Maintenance openings shall be constructed in a manner to ensure sediment remains behind silt fence.

12. Joining sections shall not be placed at sump locations.

13. Sandbag rows and layers shall be offset to eliminate gaps.

LEGEND

- Tamped backfill
- Slope direction
- Direction of flow

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DETAIL A

50 X 50 wood stake

Silt fence fabric

150

150

JOINING SECTION DETAIL (TOP VIEW)

Fabric section B (See notes 6, 7 & 12)

Stake A

Stake B

Fabric section A (See notes 6, 7 & 12)

END STAKE DETAIL (TOP VIEW)

50 X 50 wood stake (See note 3)

Fabric (See note 8)

OPTIONAL MAINTENANCE OPENING DETAIL (SEE NOTE 11)

Stake

Fabric

Toe of slope

End stake

2.5 m

Sandbags (2-layers high)

Slope

Fabric

Stake

600±

2.5 m

45°

End stake

SECTION A-A

Setback varies (See note 4)

50 X 50 Wood stake (See notes 3 & 5)

See detail A

750

450

Fabric

150

150

150

Toe of slope

Slope

END DETAIL

Silt fence

End stake (See note 2)

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